CLAIMS

What Is Claimed Is:

1. A system for the therapeutic treatment of abnormal protein-related or prion-related diseases of a human patient's brain or neurological system comprising:

(a) acoustic exposure therapy means comprising at least one acoustic or vibration emitter for acoustically or mechanically coupling, directly or indirectly, acoustic or vibratory emissions into a brain or neurological region which has been, is, or is expected to potentially be subject to the nucleation, growth or deposition of abnormal-protein or prion-related deposits, nodules or bodies;

(b) means for exciting said emitter to emit acoustic or vibration energy with a desired characteristic; and

(c) said emitter adapted to deliver therapeutic acoustic or vibration energy, directly or indirectly, to at least one of said brain or neurological regions, the therapy designed to provide, enable or accelerate at least one of the following therapy processes:

(i) physical breakup, breakdown, erosion, dispersion, disentanglement, de-aggregation, redistribution, dissolution, de-agglomeration, de-amalgamation or permeation of at least some said deposits, nodules or bodies,

(ii) interference in, slowing of, or reversal of at least one physical, chemical, biological or genetic deposit, nodule or body formation-process, formation-sequence or formation pathway anywhere in the process, sequence or pathway, and

(iii) aiding the recovery, growth, regrowth, new growth or improved chemical, physical, biological, genetic or cognitive functionality of brain-related or neurological-related cells, physiology or functional pathways negatively impacted or stressed by the deposition of, formation of, or presence of said deposits, nodules or bodies or their associated formation processes.

2. The system of claim 1 wherein said at least one emitter is located outside the body of said patient.

3. The system of claim 2 wherein said at least one emitter is located outside the skull of said patient.

4. The system of claim 3 wherein therapeutic acoustic or vibratory energy is directed or passed through or across at least a portion of the patient's blood-brain barrier or skull bone.

5. The system of claim 4 wherein at least some of said therapeutic acoustic or vibratory energy opens at least a portion of said blood-brain barrier, at least temporarily, for enhanced passage at least one of inwards or outwards, of medicaments, drugs, byproducts of the deposition therapy process itself or disease species.

6. The system of claim 4 wherein said therapeutic acoustic or vibratory energy is at least one of: (a) below the unaided cavitation threshold and therefore blood brain barrier opening via unaided cavitation mechanisms is largely avoided, (b) above the unaided cavitation threshold and therefore cavitation significantly aids the opening of the blood brain barrier, and (c) above a reduced energy level required to cavitate or excite an administered microbubble, microparticulate or other cavitation or excitation agent such that its vibrational motions significantly aids opening of the blood brain barrier.

7. The system of claim 1 wherein at least one said emitter is located inside the body of said patient.

8. The system of claim 7 wherein at least one said emitter is located inside the skull of said patient.

9. The system of claim 8 wherein said at least one emitter is located in a natural neurological lumen, cavity or passage adjacent to or within the brain or neurological system and said emitter is capable of emitting or directing therapeutic energy into a surrounding, adjacent or nearby brain or neurological region.

10. The system of claim 8 wherein said at least one emitter is located in or delivered into said skull via access through a craniotomy, other skull borehole or open-

ing, via any natural body lumen, through the vascular system or through a natural interior space or cavity.

11. The system of claim 1 wherein said at least one emitter is operated at least a portion of the time with at least one operating characteristic selected from the group consisting of continuous wave operation (CW), pulsed wave operation (PW), single-pulse operation, shaped-pulse operation, multipulse operation, pulse-train operation, broadband operation, narrowband operation, chirped operation, multitone operation, multifrequency operation, having a harmonic frequency, having a pre-determined waveform, having controlled duty-cycle operation, having a predetermined frequency component or spectrum, having a fundamental or primary frequency, having a variable frequency, having a predetermined constant or variable amplitude, emitting a compressive and/or rarefaction wave, emitting a shear wave, or having a frequency useful for manipulating a microbubble, microparticle or contrast agent.

12. The system of claim 11 wherein output from said at least one emitter is at least one of focused, collimated, weakly focused, unfocused, diffused, diffuse, defocused, beamformed, steered or wiggled in any manner.

13. The system of claim 12 wherein formation of said output from at least one said emitter employs electronic phase-delays applied to subelements within one or more individual emitters such that at least one said emitter is a beamforming, beam-shaping or beam-steering multielement emitter.

14. The system of claim 12 wherein formation of said output from at least one said emitter employs mechanical shaping of an acoustic component of one or more individual emitters such that at least one said emitter utilizes a mechanically-shaped acoustic component for shaping acoustic emission from at least that emitter.

15. The system of claim 1 wherein multiple acoustic or vibration emitters are employed, at least some of said emitters temporally capable of at least one of individual, simultaneous, sequential, interleaved, overlapping, and phase-delayed operation relative to at least one other emitter.

16. The system of claim 15 wherein at least some said emitters are arranged in at least one of the following manners:

(a) at least one of said emitters is one of mechanically defocused, mechanically collimated, mechanically weakly focused, mechanically focused, or mechanically diffused or diffuse and said multiple emitters together allow for greater total brain-volume coverage or skull-area coverage than that offered by a single said emitter;

(b) the arrangement of (a) but wherein electronic phase-delay firing between at least two said emitters is also used for purposes of beam forming, steering, slewing or wiggling of emissions;

(c) the arrangement of (a) or (b) wherein phase delays are applied within at least one said emitter possessing at least two subelements such that at least one said emitter can internally provide some beam manipulation or slewing;

(d) at least one said emitter is mounted in or to a receptacle, hole or locating mechanism in or on a headpiece designed to hold or position at least one emitter;

(e) at least one said emitter can be attached to, mounted upon or located by said patient's headpiece in more than one possible position or angle relative to the skull;

(f) at least one said emitter is mounted in, on or located by said patient's headpiece in response to known brain or neural therapy target positions as determined by a brain or neural image; and

(g) at least one said emitter is acoustically coupled into a patient's brain or neurological region, with or without the aid of a headpiece or other emitter housing or locating means

(h) at least one said emitter is acoustically coupled into the skull or a therapy target region using an intermediate acoustically conductive film, gel, paste, cream or liquid.

17. The system of claim 1 wherein at least one said emitter incorporates, is thermally coupled to, or is thermally managed or monitored by a cooling means, temperature control means or temperature monitoring means which controls or monitors the temperature of (a) said at least one emitter or (b) any portion of a patient's anat-

omy or (c) the temperature or flow of a coolant, (d) the temperature of an acoustic couplant material juxtaposed to an emitter.

18. The system of claim 17 wherein at least one temperature of at least one portion of said patient's anatomy is monitored, deduced or projected and utilized in controlling, limiting, adjusting or setting a power delivery parameter of said system, manually or automatically.

19. The system of claim 1 wherein at least one said emitter is located inside the patient's skull, the emitter capable of emitting acoustic or vibration therapy energy into at least one selected adjacent or affected brain or neurological region, said emitter being at least one of: (a) an emitter which emits a fixed beam relative to itself, (b) an emitter which emits an electronically steerable beam, steerable relative to itself, and (c) an emitter which can have its beam mechanically steered or moved via physical movement of the emitter itself or of an interior portion thereof, (d) an emitter which emits a focused, weakly focused, collimated, defocused, unfocused diffused or diffuse emission pattern.

20. The system of claim 1 wherein the system is sufficiently portable that it may be operated in at least one of: (a) at a patient's home, (b) at a clinic, (c) at a nursing home, (d) at a doctor's office, (e) at an out-patient facility, (f) next to a chair or bed in which the patient resides, (g) at a chosen hospital bedside, and (h) in a manner allowing the patient to view or hear music, television or video content and thus be simultaneously entertained.

21. The system of claim 1 wherein said at least one brain or neurological region is chosen for a therapy exposure or session, or such an exposure or session is designed, planned or monitored with the help of at least one of the following:

(a) at least one radiological, diagnostic or functional image or graphic representation of said patient's brain, brain function, metabolism, neurology or neurological function or disease state;

(b) at least one statistical model or database based on a relevant patient or human population;

(c) at least one lab-test performed on said patient or on at least one patient's lab specimen, invasively or noninvasively; and

(d) at least one incidence of at least one of the above choosing, designing or monitoring methods taking place at least once before, during or after a therapy.

22. The system of claim 21 wherein said image or graphical representation is obtained using at least one of: positron-emission tomography (PET), single photon emission computed tomography (SPECT), functional positron emission tomography (fPET), magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), computed tomography (CT), computer aided tomography (CAT), X-Ray imaging, fluoroscopy, and ultrasound imaging (US) or using a spectroscopy technique based on one or more of these tools.

23. The system of claim 21 wherein said statistical model or database is one based on at least one of: (a) a database including living or deceased patients, (b) a database including genetic tendencies to acquire said disease or of genetic test results, (c) a database including risk factors for said disease, (d) a database including lab-test results, (e) a database including data from said patient, (f) one or more radiological, diagnostic or functional image of at least one patient, and (g) any patient record or report.

24. The system of claim 1 wherein a parameter of a given therapy session or a number of or parameter of further sessions to be undergone is determined, at least in part, by the use of at least one lab-test , or radiological, diagnostic or functional image or graphical representation which provides information relating to the current state, a recent state or an anticipated state of said disease in said patient.

25. The system of claim 24 wherein at least one said lab-test involves the taking or observing of a sample or portion of bodily fluid or bodily tissue and said sample is either non-invasively observed or is physically taken from the patient at least once, at least temporarily, before, during or after a therapy.

26. The system of claim 24 wherein at least one said lab-test involves the observation, recording or measurement of a property or state of the patient's spinal fluid, blood, urine, skin, tissues, other bodily fluid or physiological parameter and said lab-test is performed on said patient or on patient's sample at least once before, during or after a therapy invasively or noninvasively.

27. The system of claim 1 wherein said abnormal protein-related or prion-related disease affecting or expected to potentially affect the patient's brain or neurological system, directly or indirectly, is diagnosed to possibly, likely or certainly be one or more of: Guam-Parkinsonism dementia complex, Dementia Pugilistica, Parkinson's Disease, adult Down Syndrome, Subacute Sclerosing Panencephalitis, Pick's Disease, Corticobasal Degeneration, Progressive Supranuclear Palsy, Amyotrophic Lateral Sclerosis/Parkinsonism Dementia Complex, Hallervorden-Spatz Disease, Neurovisceral Lipid Storage Disease, Mediterranean Fever, Muckle-Wells Syndrome, Idiopathetic Myeloma, Amyloid Polyneuropathy, Amyloid Cardiomyopathy, Systemic Senile Amyloidosis, Hereditary Cerebral Hemorrhage with Amyloidosis, Alzheimer's Disease, Scrapie, Creutzfeldt-Jacob Disease, Fatal Familial Insomnia, Kuru, Gerstamnn-Straussler-Scheinker Syndrome, Medullary Carcinoma of the Thyroid, Isolated Atrial Amyloid, Beta2-Microglobulin, Amyloid in dialysis patients, Inclusion Body Myositis, Beta2-Amyloid deposits in muscle wasting disease, Islets of Langerhans Diabetes Type2 Insulinoma or the Polyglutamine diseases including Huntington's Disease, Kennedy's Disease, and all forms of Spinocerebellar Ataxia involving extended polyglutamine tracts.

28. The system of claim 27 wherein the disease is a form of Alzheimer's Disease and at least one type of plaque is being formed or is expected to form.

29. The system of claim 28 wherein a targeted plaque or plaque-forming process is related to at least one of senile plaque and fibril plaque formation contributing to a current or anticipated form of Alzheimer's disease.

30. The system of claim 1 wherein at least one of a drug, medicament, vitamin, mineral or controlled dietary matter or content is either (a) utilized in support of or in cooperation with at least one of said breakup, interference, and aiding such that the total overall therapy delivered over one or more therapy sessions incorporates the use of said drug, medicament, vitamin, mineral or dietary matter or content and the use of said acoustic or vibratory exposure therapy, with the drug, medicament, vitamin, mineral or controlled dietary matter or content and said acoustics or vibrations being used simultaneously, sequentially or both, or (b) employed, at least in part, to ameliorate the side effects of any acoustic or vibratory exposure itself.

31. The system of claim 30 wherein said at least one acoustic or vibratory therapy exposure, directly or indirectly, at least one of enhances, enables, accelerates, initiates or extends the action of said drug, medicament, vitamin, mineral or controlled dietary content in terms of treatment rate or completeness of the extent of treatment benefit.

32. The system of claim 31 wherein said enablement, enhancement, initiation, extension or acceleration is at least one of: (a) caused by the action of said acoustic or vibratory energy upon said at least one drug, medicament, vitamin, mineral or ingested controlled dietary matter or content and (b) caused by the action of said acoustic or vibratory energy on the anatomy, body tissue or body fluids of said patient, thereby favorably preparing said anatomy, tissue or body fluid for subsequent and/or simultaneous exposure to said at least one drug, medicament, vitamin, mineral or controlled dietary matter or content.

33. The system of claim 30 wherein said at least one drug, medicament, vitamin, mineral or controlled diet provides anti-inflammatory or anti-ischemic benefit.

34. The system of claim 30 wherein said at least one drug, medicament, vitamin, mineral or ingested dietary content, at least in part, reaches a brain or neurological region by passing through the blood-brain barrier (BBB), either unaided or in aided form, wherein said aid comprises one of:

(a) the use of said at least one form of a drug, medicament, vitamin, mineral or controlled dietary ingested content known to chemically open said BBB to itself or to the ingress of another therapeutic drug;

(b) the use of said acoustic or vibratory energy to open said BBB via cavitation, bubble oscillation, heating or any other mechanisms;

(c) the use of said acoustic energy to drive, transport or diffuse said at least one drug, vitamin, mineral or controlled dietary ingested content through said BBB without cavitation mechanisms predominating said driving; and

(d) the use of a combination of said at least one drug, vitamin, mineral or controlled dietary content opening said BBB and also itself delivering therapy to said brain or neurological regions of interest.

35. The system of claim 30 wherein the acoustic or vibratory exposure of at least some brain or neurological tissues accelerates, directly or indirectly, the perfusion, diffusion, transport, or physical, chemical or biological therapeutic action of said at least one said drug, medicament, vitamin, mineral or controlled ingested dietary matter or of a reactive species or product thereof.

36. The system of claim 30 wherein acoustic streaming, acoustic radiation-pressure or acoustic-cavitation developed in or near said brain or neurological region by said acoustic or vibratory exposure assists in transport, perfusion, diffusion, disbursement, delivery or distribution of said at least one drug, medicament, vitamin, mineral or controlled dietary ingested matter or of a subspecies, constituent or by-product thereof.

37. The system of claim 30 wherein said at least one drug, medicament, vitamin, mineral or controlled dietary matter comprises or includes at least a microbubble or microparticulate agent administered or ingested into the body, into the blood, into a tissue or bodily fluid or into a brain or neurological region, said agent providing for enhanced or reduced power-threshold cavitation or bubble oscillation when under acoustic or vibratory illumination, said enhanced cavitation or oscillation at least micromechanically and therapeutically contributing to at least one of said breakup, interference, and aiding therapy process.

38. The system of claim 37 wherein said microbubble or microparticulate also acts as a drug or medicament carrier or drug-bearing medium, at least one therapeutic drug or medicament emanating from said microbubbles or microparticles at some point after administration or ingestion into the body of said patient, said emanation taking place by natural leakage, diffusion or release of drug from said microparticles or by acoustically excited release, diffusion or leakage from said particulates.

39. The system of claim 30 wherein at least one drug, medicament, vitamin, mineral or controlled dietary matter supporting the therapy, directly or indirectly, includes at least one of: 4-hydroxynonenal, acetylcholinesterase or acetylcholine modulators, 1-amino-3,5-dimethyladamantane hydrochloride, acetyl-1-carnitine, alpha 2-macroglobulin drugs, alpha-synuclein or synuclein modifiers or modulators, antibodies, anti-coagulants, anti-inflammatories, anti-ischemics, anti-oxidants, anti-sense drugs, apolipoprotein or apolipoprotein-gene modifiers or modulators, apomorphine-based molecules, donepezil, aspirin, beta-secretase modifiers or modulators, biological reducing agents, celecoxib, 5-aminosalicyclic acid, chelation modulators or agents, cholesterol modulators, cholinergic drugs, coenzyme Q10, tacrine-hydrochloride, cognition-enhancing drugs, cyclooxygenase-2 (COX-2) inhibitors, C-terminal tau inhibitors, diets controlling calories or fat, diets providing anti-oxidants, diets providing vitamins or minerals, domain ligands, donepezil, diazespam, drugs which affect protein kinase C pathways or tyrosine kinase pathways or phosphotyrosine pathways, drugs which affect copper or zinc binding to clioquinol, drugs which modulate aluminum, zinc, copper, iron, fluoride or calcium species, estrogen, drugs which affect APP protein or mutant APP, drugs which affect any one of APOE or APOEe4 or any APOE allele, drugs which affect presenilin protein or presenilin 1, drugs which affect a proteolysis function, drugs which affect tau genes or tau mutations, drugs which affect the behavior of chromosome 17, drugs which reduce oxidative damage, drugs which reduce oxidative damage to RNA, drugs which reduce free radicals, estrogen-like drugs or estrogen-like replacement therapies (ERTs), drugs which treat the cholinergic system, rivastigmine tartrate, folate or folic acid modulators, galantamine, gamma-secretase drugs, gene delivery drugs, genetically engineered drugs, Ginkgo Biloba, glutamate modulators, homocysteine modulators, hormones, Hydrochloride, hyperzine A, H_2O_2 modulators, ibuprofen, immunomodulating drugs, indomethacin, inflammatory cytokines, insulin degrading enzyme IDE, iron

modulators or modifiers, ketone drugs, kinesin-1 modulators, leteprinim potassium, lithium, M-CSF or macrophage colony stimulating factor, memantine, mimetics, monoclonal antibodies, matrix metalloproteinase (MMP) modulators, leteprinim-potassium, neurotrophic factors, neural growth factors (NGFs), notch protein drugs, non-steroidal anti-inflammatories (NSAIDS), nitric oxide modulators, parkin gene modulators or modifiers, peptides, plasmins, PP1 enzyme blockers, prednisone, prodrugs, protease inhibitor gene drugs, protein-kinases, proteolytic antibodies, R-flurbiprofen, galantamine HBr, rivastigmine, serum nerve growth factor, rofecoxib, statins, stem-cells or stem-cell derived medicaments, steroids, tacrine, transplanted cells, transplanted cell constituents, transplanted genetic materials, transplanted body fluids or fluid constituents, triterpenoids, ubiquitin-C-hydrolase-L1, vaccines, rofecoxib,, vitamins, Vitamin C, and Vitamin E, beta-amyloid modifiers or modulators, tau modifiers or modulators, vaccines, PYM50228, gamma-aminobutyric acid (GABA), GABA-like drugs, muscimol, benzodiazepines, Wnt, beta-catenin, HoxB4, and talsaclidine.

40. The system of claim 30 wherein the patient at least one of is administered, ingests or takes a drug, medicament or controlled dietary matter before, during or after at least one acoustic or vibratory exposure, the drug or medicament reaching a tissue to be treated, directly or indirectly, before, during or after an exposure to said acoustic or vibratory energy.

41. The system of claim 1 wherein at least one drug, medicament, vitamin, mineral or controlled dietary matter or content is used for at least one of: (a) to provide, enable, initiate, extend or accelerate at least one said breakup, interference, or aiding process and (b) to ameliorate a side-effect of said acoustic or vibratory exposure, and said at least one drug, medicament, vitamin, mineral or controlled dietary matter or content is administered, ingested, taken-in, therapeutically delivered, provided, prescribed or recommended to said patient.

42. The system of claim 41 wherein said administration or intake is via (a) oral ingestion by eating or drinking, (b) nasal or oral inhalation, (c) injection or introduction anywhere into the body of said patient, either percutaneously, transdermally or via a natural orifice (d) metered or controlled release from outside or inside the body of said patient, (e) via a skin-patch, (f) via a catheter or port, or (g) via the delivery of genetic or cellular materials from outside the body.

43. The system of claim 41 wherein said administration, provision or intake is via metering or controlled release from a pump, injector or other flow, flow-direction, or pressure-controlled source located anywhere outside or inside the body of said patient.

44. The system of claim 1 wherein said acoustic or vibratory exposure provides, initiates, extends, enables or accelerates to a useful degree the rate or extent of at least one said breakup, interference or aiding process via mainly acoustic-driven mechanisms without the required use of medicaments, vitamins, minerals or controlled dietary ingested matter for said providing, enabling or acceleration.

45. The system of claim 1 wherein at least one said acoustic or vibratory exposure is arranged or chosen to utilize at least one acoustic or vibratory wavelength which bears a calculatable or histological relationship to a characteristic dimension of a plaque, fibril or prion-related deposit or defect, said choosing causing a desirable mechanical interaction between said plaque, fibril, nodule or defect and said acoustic or vibratory waves, thereby micromechanically contributing to at least one of said breakup, interference, and aiding processes.

46. The system of claim 45 wherein said characteristic dimension is approximately that of a representative fibril, nodule, defect or deposit dimension.

47. The system of claim 1 wherein a cooling or heat-exchange means is provided which is in thermal communication with at least one of: (a) an emitter, (b) any of the anatomy of said patient, and (c) the skull of said patient, and heat flows directly or indirectly either to or from said cooling or heat-exchange means to or from at least one of an emitter, a patient's anatomy or a patient's skull.

48. The system of claim 47 wherein the cooling or heat-exchange means provides for: (a) controlling or limiting the temperature of said at least one emitter, directly or indirectly, (b) controlling or limiting the temperature of at least a portion of said patient's anatomy or of the skull of said patient, directly or indirectly, or (c) the use of higher acoustic powers than would otherwise be possible without use of said cooling or heat-exchange means, while maintaining safe maximum patient temperatures.

49. The system of claim 1 further including at least one of: (a) a cooling or heat-exchange means for transferring heat to or from said at least one emitter, from a portion of the patient's anatomy, or from the skull of said patient and the operation of said cooling or heat-exchange means is in response or in support of the operation of said at least one emitter or to temperatures caused thereby in the skull or anatomy, and (b) a drug, medicament, vitamin or mineral delivery means providing a drug, medicament, vitamin or mineral in support of at least one of said breakup, interference, and aiding therapy processes, said drug, medicament, vitamin or mineral delivered to said patient responsive to at least one of a flow control, a pressure control, a dosage control, a blood-concentration control, a sensor, a software or firmware program, a system control setting, a sensor, a timer, a real-time or individual-use lab-test or test-sampling, and a practitioner's direction.

50. The system of claim 1 wherein at least one emitter's output is mechanically scanned relative to said patient's brain, either by patient movement, system movement, emitter movement or emitter relocation on the headgear or a combination thereof.

51. The system of claim 1 further including a removable helmet, head-band or other juxtaposed or head-attached structure for securement to or juxtaposition to the head of said patient, said helmet or structure incorporating or providing mounting, locating or positioning means for at least one said emitter, said helmet/structure or emitter(s) therein or thereon becoming acoustically coupled to the patient, said coupling being achieved into or through the patient's scalp or skull thereby allowing delivery of acoustics into the patient.

52. The system of claim 51 wherein said patient's head is at least partially in, enclosed by or surrounded by a helmet, head-band or head-attachment structure containing, supporting, locating or positioning at least one said emitter, said structure being at least partially supported by said system yet also being mounted to or at least placed near or on the patient's head in order to perform said therapy.

53. The system of claim 51 wherein the patient's head is in a helmet, head-band or head-attachment structure containing or having attached thereto or thereon at least one said emitter, said structure having one or more of an umbilical, cable or coolant lumen which connects or is connectable to said system.

54. The system of claim 1 further including acoustic coupling means for coupling output from said at least one emitter directly or indirectly into a tissue or body fluid of said brain or neurological system, said acoustic coupling means utilizing at least one of (a) an interposed liquid, gel, paste, cream, emulsion or acoustic-standoff, (b) an interposed inflatable fillable or soakable bag, membrane or sponge material, (c) an interposed acoustically water-like material.

55. The system of claim 54 wherein said acoustic coupling means also provides some skull size or shape adaptability for various-sized or shaped patient's heads for a given patient or from patient to patient.

56. The system of claim 1 wherein operational set-up or compensation is made for at least one of the following variables or changes: (a) variable skull thickness or shape from location to location on a given skull, or variable skull thickness or shape from patient-to-patient, (b) a variable skull, scalp or emitter temperature from location to location or at a single location over time, (c) a change in a relevant or representative brain or neurological temperature, (d) a change in a local or a nearby temperature in a general region of diseased or treated brain or neurological tissue, (e) a change in the result of an invasive or noninvasive lab-test monitoring a variable related to a state of the disease or to a state of a plaque-burden, (f) a change in a metabolic or physiological instrument reading or patient-monitor, (g) a change in the patient's comfort level, (h) a change or variation in the acoustic velocity, attenuation or dimension of a

patient's skull, skin, brain or neurological tissue or plaque, (i) a change or variation in detected brain-tissue perfusion or in cerebral lumen blood-flow, (j) a change in the cavitation or oscillation behavior of a microbubble or microparticulate, (k) a change in an actual or desired concentration or of a delivery parameter of a drug, (l) a change in an actual or desired acoustic power to be delivered, (m) a change in the actual or desired concentration of a species of interest in a blood, urine, skin or spinal fluid test or ongoing sampling, and (n) a change in a brain radiological or functional image or graphical representation, (o) a change in the amount of, nature of or presence of undesired side-effects being experienced or detected or anticipated., (p) a change in blood pressure or cerecrospinal fluid pressure, (q) a change in a state of inflammation whether due to the disease or the acoustics themselves, (r) a change in any brain function, (s) changes in locations or concentrations of plaque, fibrils or nodules within a single patient over time or from patient to patient, and (t) direction provided by software, firmware or by an operator or overseer of the system, regardless of whether any one of these is locally or remotely located.

57. The system of claim 1 wherein acoustic or vibratory energy is also utilized to diagnostically probe or measure a characteristic of the brain, skull, neurological system, disease state, physiology or temperature of said patient or operation of an emitter, the characteristic useful to set up, control or insure safe or efficient operation of said system.

58. The system of claim 1 wherein said at least one acoustic or vibratory emitter comprises an ultrasonic, acoustic or vibratory element which is electrically, electrostatically, magnetically, magnetostrictively, electromagnetically or optically driven or wherein said emitter is an outport port on an acoustic waveguide.

59. The system of claim 1 wherein said at least one acoustic or vibration emitter is coupled, directly or indirectly, into said patient's brain or neurological system through at least one of an upper or lower jaw, neck or spine of said patient.

60. The system of claim 1 wherein said acoustic or vibratory coupling means includes:

(a) a shaved head or a head with reduced hair quantity;

(b) wetted hair using any hair-wetting material or a wetted scalp using any scalp-wetting material;

(c) wetted or gell-coated emitter or emitter portions;

(d) inflated or filled expandable acoustically-conductive bags, membranes or standoffs;

(e) provision of a saturatable or soakable material which acts as an acoustically transparent standoff or coupler in the soaked state;

(f) provision of a flexible or stretchable acoustically-transparent skullcap which is wettable or which promotes acoustically coupling on at least one inner or outer surface;

(g) provision of a flexible or stretchable skullcap which serves to control the patient's hair;

(h) flow or placement of an acoustically conductive liquid in an emitter/skull interface region;

(i) flow or placement of an acoustically conductive coolant or other heat transfer media in an emitter/skull interface region; and

(j) flow or placement of an acoustically conductive gel or paste in an emitter/skull interface region.

61. The system of claim 1 wherein at least a portion of one said deposit, nodule or body undergoes at least one of shear, compressional or tensile-distortion or stress or is excited into a vibratory mode by an acoustic or vibratory emission having a wavelength chosen to bear a relationship to a characteristic dimension of at least one said deposit, nodule or body, the distortion, stress or vibratory behavior favorably contributing to at least one of said therapeutic breakup, interference, and aiding process.

62. The system of claim 1 wherein said deposits, nodules or bodies are, at least in part, one of spatially distributed, diffusely distributed, aggregated, agglomerated, intracellularly situated, extracellularly situated, fibril-like, plaque-like, have a microscopic sheet structure or are directly or indirectly associated with cognitive losses.

63. The system of claim 1 wherein at least said aiding process is practiced in order to at least eventually achieve at least one of: (a) enhanced perfusion, diffusion, transport or distribution of blood or cerebrospinal fluid or fluid constituents including disease species, (b) enhanced perfusion, diffusion, transport or distribution of a drug or medicament, (c) enhanced perfusion, diffusion, transport or distribution of a functional signaling chemical or species, (d) enhanced cognitive function, (e) enhanced transport of a plaque, prion or deposit breakdown product or related debris, (f) enhanced perfusion, diffusion, transport or distribution of a medicament incorporating stem cells, living cells, or byproducts or derivatives of cells, whether natural cells or genetically manipulated cells, and (g) dead or living cells or cell constituents or derivatives serving as a vaccine

64. The system of claim 1 wherein at least one of: (a) said acoustic or vibratory exposure contributes to enhanced cognitive function or a decrease in the rate of cognitive loss, and (b) said acoustic or vibratory exposure combined with the sequential or simultaneous use of a drug, medicament or controlled dietary intake both contribute in at least some manner to enhanced cognitive function or a decrease in the rate of cognitive loss, regardless of whether said acoustic or vibratory energy provides, enables or accelerates the action of the drug, medicament or dietary content.

65. The system of claim 64 wherein said acoustic or vibratory energy provides, enables, accelerates or initiates a beneficial action of at least one said drug, medicament or dietary content, either directly or indirectly.

66. The system of claim 1 wherein said aiding includes causing the concentration or activity of a chemical, genetic, cellular or biological material, reactant, product or byproduct which plays a damaging role or is involved in the damage sequence or chain of events of the neurodegenerative disease is at least partly reduced, partly inactivated, chemically tied up or rendered inactive such that the rate of neurodamage is slowed or stopped.

67. The system of claim 66 wherein said activity or concentration is reduced, tied up or made inactive accompanied by its ultimate removal from the body with the

help of a natural body process including at least one of: (a) brain metabolism, (b) brain perfusion or circulation of blood, (c) cerebrospinal fluid production or circulation, and (d) body excretion as waste.

68. The system of claim 67 wherein said acoustic or vibratory exposure facilitates or accelerates said subsequent removal in any manner.

69. The system of claim 1 wherein the patient at least one of:

(a) receives an initial lab-test, imaging session, diagnostic session or other exam or test in order to stage the disease or to understand the disease potential;

(b) receives one or more of any one or more of said breakup, interference or aiding therapies over a period of one or more sessions;

(c) receives a combination of at least two of said breakup, interference or aiding therapies over a period of one or more sessions;

(d) receives at least one each of said breakup, interference, and aiding therapy in at least one session;

(e) receives at least one each of said breakup, interference, and aiding therapy over a period of two or more sessions;

(f) has a body fluid or tissue sample taken before, during or after at least one therapy session;

(g) has a body fluid or tissue analyzed or monitored invasively or noninvasively, before, during or after at least one therapy session; and

(h) undergoes functional imaging or cognitive testing.

70. The system of claim 1 wherein cooling or heat-exchange is employed to maintain, limit or control a temperature related to the patient's anatomy or to the therapy delivery means, regardless of whether the system is aware of the actual temperature present.

71. The system of claim 1 wherein a wired, wireless, digital, analog, telephony, data, fiberoptic, video or network connection allows for interaction with the therapy system or patient from a distance or from a remote location.

72. The system of claim 1 wherein: (a) multiple emitters are employed, each primarily treating at least some unique emitter-assigned brain or neurological system region or subregion, (b) multiple emitters are employed and there is a significant overlap in the treated or treatable regions or subregions addressable by said emitters, (c) multiple emitters are employed in any manner and operated sequentially, (d) multiple emitters are employed in any manner and operated simultaneously, (e) multiple emitters are employed in any manner and at least two are operated with controlled phase angle delays relative to each other, (f) at least one emitter comprises multiple acoustic subelements, (g) at least one emitter steers or shapes emissions, at least in part, using a mechanically shaped acoustic component, (h) at least one emitter is moved among at least two different possible mountable positions or angles over a period of one or more therapies, (i) at least one emitter mates with electrical or coolant connectors predisposed in the helmet or headgear, (j) at least one emitter structure also serves to form the structure of the helmet itself, (k) the helmet or headgear or emitter housing or holder is, at least in part, directly made from material which is capable of emitting or receiving acoustic energy, (l) the helmet or headgear is mechanically mated to the patient during operation, (m) the patient rests or places his/her head juxtaposed against or to a pillow-like entity which holds an emitter, (n) the headgear, helmet or pillow structure holding at least one emitter also incorporates a thermal control means during operation, (o) an emitter is chosen for its frequency or penetration ability, (p) an emitter is chosen for its fit to the helmet or to the patient, (q) the patient sits, reclines or lies down during the therapy, (r) the patient is entertained with audio and/or video content during the therapy, (s) the patient undergoes therapy using a portable or semiportable system, (t) the patient undergoes therapy at home, at a clinic, at a doctor's office, at an outpatient office, at a hospital or at a nursing home, (u) the patient intakes a drug, medicament, controlled dietary content or therapeutic genetic or cellular substance before, during or after at least one therapy session, both the emissions and the drug contributing individually or cooperatively, to therapeutic benefit, (v) comfort or adjustability is provided by an intervening acoustic standoff which is shapable, the emitters passing their emissions through said standoff, the shapability adaptable to the patient's head, (w) a shapable acoustic standoff serves as a conforming pillow for patient comfort or for improved acoustic coupling, (x) a patient acoustic coupling means incorporates a thermal control feature, or (y) an emitter itself incorporates a connector or a thermal control means.

73. The system of claim 1 wherein said acoustic or vibratory exposure is of intensities or powers which allow for prolonged exposure or multiple exposures of said patient's brain or neurological system without accumulating unacceptable acoustically-induced permanent damage to neurologically significant portions of the patient's anatomy, tissues or fluids.

74. The system of claim 1 wherein said acoustic or vibratory exposure is of intensities or powers such that the accumulated time at temperature of treated brain regions is below that which would cause significant permanent thermal damage to healthy cells.

75. The system of claim 1 wherein said ultrasonic power per unit area is between 5 milliwatts per square centimeter and 10 watts per square centimeter.

76. The system of claim 75 wherein at least one of:

(a) at least one frequency between 1 hertz and 2 megahertz is employed with or without cooling or heat-exchange;

(b) at least one frequency of between 2 megahertz and 5 megahertz is employed with cooling or heat-exchange;

(c) the temperature rise in a portion of the patient's tissue or bodily fluid is limited to 5 degrees centigrade or less.

(d) the duty cycle of the acoustic power is set between 10 and 25% on-time; and

(e) and healthy tissues are spared permanent unacceptable thermal or acoustic damage.

77. The system of claim 1 wherein said at least one acoustic emitter is inside the skull of said patient or in an interior location of said patient's brain or neurological system and said acoustic or vibratory energy emanates in at least one direction generally outward toward a patient's scalp or toward a skinline.

78. The system of claim 1 wherein any beam-forming or beam-steering is done at least for the purpose of achieving increased or more uniform coverage of targeted or targetable brain or neurological regions.

79. The system of claim 1 wherein said disease is, at least in part, resident in any of the following brain or neurological tissues: hippocampus, entorhinal cortex, cerebral cortex, posterior cingulated cortex, neocortex, allocortical regions, basal forebrain, or cerebellar tissues.

80. The system of claim 1 wherein said acoustic or vibratory energy is capable of providing, enabling, accelerating or initiating said breakup, interference or aiding process, said acoustic or vibratory therapy process itself not requiring a drug, medicament or controlled dietary content to proceed at a useful pace or to a useful extent.

81. The system of claim 1 wherein a drug, medicament or controlled dietary content is used to comfort the patient or to relieve existing or potential side-effects of said acoustic or vibratory exposure, regardless of whether it contributes to the therapy itself

82. The system of claim 80 wherein said breakup, interference or aiding process enhances patient cognition at least after some time has passed.

83. The system of claim 1 wherein cognition loss is at least slowed, stopped or reversed at least after some time has passed.

84. The system of claim 1 wherein the primary physical components of said system include a console or control box, a headpiece incorporating at least one said emitter, and at least one connecting or connectable cable or lumen connecting said console and said headpiece.

85. The system of claim 1 wherein a bodily fluid such as blood or cerebrospinal fluid is manipulated in any manner in cooperation with at least one said acoustic or vibratory exposure or by said exposure, the combined exposure and manipulation having at least one of additive, extending or acceleration-of-therapy effects.

86. A method for the therapeutic treatment of abnormal protein-related or prion-related diseases of a human patient's brain or neurological system comprising:

(a) acoustically coupling said patient's brain or neurological system to acoustic therapy means comprising at least one acoustic or vibration emitter for acoustically or mechanically coupling, directly or indirectly, acoustic or vibratory emissions into a brain or neurological region which has been, is, or is expected to potentially be subject to the nucleation, growth or deposition of abnormal-protein or prion-related deposits, nodules or bodies;

(b) exciting said emitter to emit acoustic or vibration energy with a desired characteristic; and

(c) delivering therapeutic acoustic or vibration energy from said emitter, directly or indirectly, to at least one said brain or neurological region, the therapy designed to provide, enable, accelerate or initiate at least one of the following therapy processes:

(i) physical breakup, breakdown, erosion, dispersion, disentanglement, de-aggregation, redistribution, dissolution, de-agglomeration, de-amalgamation or permeation of at least some said deposits, nodules or bodies,

(ii) interference in, slowing of, or reversal of at least one physical, chemical, biological or genetic deposit, nodule or body formation-process, formation-sequence or formation pathway anywhere in the process, sequence or pathway, and

(iii) aiding the recovery, growth, regrowth, new growth or improved chemical, physical, biological, genetic or cognitive functionality of brain-related or neurological-related cells, physiology or functional pathways negatively impacted or stressed by the deposition of, formation of, or presence of said deposits, nodules or bodies or their associated formation processes.

87. The method of claim 86 wherein a drug, medicament or controlled dietary content optionally being administered enhances therapy effectiveness or comfort, independently or in cooperation with the emitted energy.

88. A system for the therapeutic treatment of abnormal protein-related or prion-related diseases of a human patient's brain or neurological system comprising:

(a) means to direct acoustic or vibrational energy into or through at least one such diseased or potentially diseased anatomy portion; and

(b) an optional drug, medicament or controlled dietary content capable of contributing to the therapy also directly or indirectly delivered to the portion,

wherein the acoustics and optional drug together at least slow a cognitive loss process by slowing , stopping or reversing a deposition process.

89. The system of Claim 88 wherein the drug, medicament or dietary content is at least one of: (a) known to provide useful therapy even without the acoustic emissions present, and (b) requires acoustic emissions to directly or indirectly cause the drug to be of therapeutic benefit

90. The system of claim 88 wherein the drug, medicament or dietary content has its therapeutic contribution enabled, enhanced, initiated, accelerated or extended due to an effect, latent effect or side-effect of at least one acoustic exposure

91. The system of claim 88 wherein the acoustic emissions are unfocused, weakly focused, diffused, diffuse, collimated or overlapping spatially or temporally

92. The system of claim 88 wherein the drug also serves as an imaging contrast agent or serves to minimize an undesirable side-effect of the acoustic exposure

93. The system of claim 88 wherein acoustic measurements or imaging is practiced in support of the therapy, regardless of whether any of the therapy emitters are also used for said measurements or imaging

94. The system of claim 88 wherein blood or cerebrospinal fluid is otherwise manipulated in cooperation with the emission therapy, said manipulation comprising at least temporary shunting of blood or cerebrospinal fluid

95. A method of at least temporarily slowing, stopping or avoiding a patient's cognitive losses associated with a neural deposition disease comprising administration of acoustic or vibrational energy into affected or potentially affected patient anatomy

portions, said energy altering, blocking or reversing a cognitively-damaging deposition process, at least temporarily.

96. A system for at least temporarily slowing, stopping or avoiding a patient's cognitive losses associated with a neural deposition disease comprising administration of acoustic or vibrational energy controllably emitted from an acoustic emitter into affected or potentially affected patient anatomy portions, said energy altering, blocking or reversing a cognitively-damaging deposition process, at least temporarily.